

to such an extent over the Plains States and the Northwest that warnings were ordered only for extreme northern Florida and the coast regions of Georgia and South Carolina.

Frost warnings were issued for portions of the East Gulf and south Atlantic States on numerous dates and were, in the main, well verified.—*Charles L. Mitchell.*

WARNINGS FROM OTHER DISTRICTS.

Chicago Forecast District.—With the exception of stock warnings on the morning of December 11 for Montana and Wyoming, no special advices of any kind were issued from the Chicago forecast center until the third decade of December, the winter up to that time being unusually mild and open. However, on the morning of December 20, a cold, high pressure area appeared in the Canadian Northwest preceded by a low of marked energy and cold wave warnings were ordered for the southern and central Plains States and the upper and lower Missouri Valley. These warnings were extended during the 21st and 22d to the eastern limits of the district. In connection with this disturbance, the stock interests in Wyoming, South Dakota, Nebraska, and Kansas were fully advised as to impending conditions, as well as heavy snow warnings issued for southern and central Wisconsin, eastern Iowa, and extreme northern Illinois. No warnings of any kind were necessary during the balance of the month.

During the period from December 10 to 20, inclusive, special forecast service was rendered the Liberal Auto & Supply Co., Liberal, Kans., each evening forecasts being telegraphed containing the expected weather for the next two days, as well as the probable minimum temperature for the following morning. This service was desired in connection with the work of erecting a large concrete and steel building. That the forecasts were much appreciated is shown by a copy of the following letter, which was received from the concern in question under date of December 21.

We wired you to-day: "Discontinue our weather service. Thanks." We have completed our roof on the garage building and your service has been very helpful. Your forecast has been accurate, there being scarcely a degree difference. Such service as yours makes one glad to know that he lives at this time of convenience and excellent service.

—*E. H. Haines.*

New Orleans Forecast District.—There were several windy days during the month, but no severe storms occurred. Small-craft warnings were displayed for all or part of the West Gulf coast on the 3d, 13th, 15th, 20th, 25th, and 26th, and were justified. The p. m. map of the 20th showed a well-defined disturbance over the upper Rio Grande Valley and southeast storm warnings were displayed from New Orleans to Corpus Christi, and were justified.

On the 6th a disturbance was central over Texas and an area of high pressure extended from the upper Missouri Valley southwestward across the Rocky Mountain States. Cold-wave warnings were ordered for the northwestern portion of the district, but the fall in temperature, as the depression moved eastward, was not sufficient for a cold wave. This was due partly to the fact that the temperatures within the anticyclone were not very low to begin with and partly to a tendency of the anticyclone to move eastward as well as southward, so that the main body of the anticyclonic area remained north of the cyclonic area.

Cold-wave warnings for the northern and western portions of the district were issued on indications of the

p. m. map of the 20th, when a depression was over New Mexico and an area of high pressure was central to the northward of eastern Montana, with conditions well defined. The warnings were verified in most localities, the temperature fall in Arkansas requiring more time than in other sections for which the warnings were issued.

On the 26th a trough of low pressure was over the Mississippi Valley and the West Gulf States and the pressure was high over western Canada. Cold-wave warnings were issued for Arkansas, eastern Oklahoma, and northern Texas, and were extended at night over northern Louisiana and to the central portion of east Texas. These warnings were generally verified. As in the preceding instance, the temperature fall in eastern and southern Arkansas, though large, was gradual. On the morning of the 28th, the cold wave reached also the lower Rio Grande Valley and the adjacent coast of Texas, with a temperature of 32° at Corpus Christi, the cold wave coming more directly south and causing a greater change on the coast than was expected.

Warnings for live-stock interests were sent out on the 6th, 21st, 26th, and 27th.

Warnings of frost or freezing temperature for coast and adjacent sections were issued on the 1st, 7th, 8th, 15th, 17th, 22d, 23d, 24th, 27th, and 28th, and were mostly verified.

Fire-weather warnings were telegraphed to Oklahoma and Arkansas on the 29th and conditions occurred as forecast.—*R. A. Dyke.*

Denver Forecast District.—On the 12th a low pressure center was over southeast Colorado. It moved north-eastward and on the morning of the 13th a moderate cold wave occurred without warnings in northwest New Mexico and adjacent parts of Arizona and Colorado. This was unusual as the low pressure center was located north of the area subsequently covered by the cold wave.

On the morning of the 20th an area of low barometer of considerable intensity occupied southern Utah. During the following 24 hours the disturbance was divided by a wedge of high pressure advancing southward along the eastern slope, one center moving to eastern Kansas while the other remained in northwestern New Mexico. Live-stock warnings were issued for eastern Colorado on the morning of the 21st. A sharp fall in temperature occurred in eastern Colorado, with zero temperatures, and strong winds in some localities.—*Frederick W. Brist.*

San Francisco Forecast District.—Frost warnings were issued in northern California on December 2, 4, and 7; in southern California and the San Joaquin Valley on December 12, and throughout the interior of California on December 13 and 20. The frosts were heavy but no material damage resulted.

Storm warnings were ordered as follows: December 1, at Point Reyes and advisory at all Washington and Oregon stations; 3d, at all Washington and Oregon stations; 5th, from Tatoosh to Mendocino; 6th, from Tatoosh to San Francisco; 7th, all Washington and Oregon stations; 9th, from Tatoosh to San Francisco; 10–11th, from Tatoosh to Point Reyes; 12th, 14th, 16th, all Washington and Oregon stations; 17th, from Tatoosh to Point Reyes; 19th, from San Francisco to San Diego; 23d, from Tatoosh to San Francisco; 26th, all Washington and Oregon stations; 27th, advisory followed by southwest warnings all Washington and Oregon stations; 29th, all Washington and Oregon stations; 30th, from Tatoosh to Point Reyes; 31st, all Washington and Oregon stations.—*G. H. Willson.*